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Document Control Desk
U. S. Nuclear Regulatory Commission
Washington, DC 20555

Docket No. 50-278
SUBJECT: Licensee Event Report, Peach Bottom Atomic Power Station Unit 3

This LER reports the following Engineered Safety Feature (ESF) actuations: Reactor Protection System (RPS) actuation Secondary Containment Isolation, and Primary Containment Isolation System (PCIS) actuation. Additionally, this LER reports a condition prohibited by Technical Specifications and a Loss of Safety Function which occurred during the event. The LER is being submitted pursuant to the requirements of 10CFR50.73(a)(2)(iv), 10CFR50.73(a)(2)(i)(B) and 10CFR50.73(a)(2)(v).

Reference:	Docket No. 50 278
Report Number:	3-00-001
Revision Number:	00
Event Date:	08/07/00
Report Date:	09/06/00

Facility: Peach Bottom Atomic Power Station Unit 3
1848 Lay Road, Delta, PA 17314

Sincerely,

Gordon L. Johnston

Gordon L. Johnston, Plant Manager

GLJ/scb

enclosure

cc: PSE&G, Financial Controls and Co-owner Affairs
R. R. Janati, Commonwealth of Pennsylvania
INPO Records Center
H. J. Miller, US NRC, Administrator, Region I
R. I. McLean, State of Maryland
A. C. McMurtray, US NRC, Senior Resident Inspector
A. F. Kirby III, DelMarVa Power

CCN 00-14073

IE22

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LICENSEE EVENT REPORT (LER)	Estimated burden per response to comply with this mandatory information collection request: 50 hrs. Reported lessons learned are incorporated into the licensing process and fed back to the industry. Forward comments regarding burden estimate to the Records Management Branch (T-6 F33), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, and to the Paperwork Reduction Project (3150-0104), Office of Management and Budget, Washington, DC 20503. If an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor and a person is not required to respond to, the information collection.
(See reverse for required number of digits/characters for each block)	

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TITLE (4)
This LER reports the following Engineered Safety Feature (ESF) actuations: Reactor Protection System (RPS) actuation and Primary Containment Isolation System (PCIS) actuation. Additionally, this LER reports a condition prohibited by Technical Specifications and a Loss of Safety Function which occurred during the event.

EVENT DATE (5)			*LER NUMBER (6)*			*REPORT DATE (7)*			*OTHER FACILITIES INVOLVED (8)*	
MONTH	*DAY*	*YEAR*	*YEAR*	*Sequential Number*	*Revision Number*	*MONTH*	*DAY*	*YEAR*	*Facility Name*	*Docket Number*
08	*07*	*00*	*00*	*001*	*00*	*09*	*06*	*00*	*Facility Name*	*Docket Number*

OPERATING MODE (9)	1	*THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)*							
			20.2201(B)		20.2203(a)(2)(v)	X	50.73(a)(2)(i)		50.73(a)(2)(viii)
POWER LEVEL (10)	100		20.2203(a)(1)		20.2203(a)(3)(i)		50.73(a)(2)(ii)		50.73(a)(2)(x)
			20.2203(a)(2)(i)		20.2203(a)(3)(ii)		50.73(a)(2)(iii)		73.71
			20.2203(a)(2)(ii)		20.2203(a)(4)	X	50.73(a)(2)(iv)		*OTHER*
			20.2203(a)(2)(iii)		50.36(c)(1)	X	50.73(a)(2)(v)		*Specify in Abstract below*
			20.2203(a)(2)(iv)		50.36(c)(2)		50.73(a)(2)(vii)		*or in NRC Form 336A*

LICENSEE CONTACT FOR THIS LER (12)

NAME	*TELEPHONE NUMBER (include area code)*
Steven C. Beck	**717.456.3243**

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

Cause	*System*	*Component*	*Manufacturer*	*Reportable to EPIX*	*Cause*	*System*	*Component*	*Manufacturer*	*Reportable to EPIX*
EC	JC	*RTV*	*R340*	*N*					

SUPPLEMENTAL REPORT EXPECTED (14)			*EXPECTED Submission Date (15)*	*Month*	*Day*	*Year*
YES (if yes, complete EXPECTED SUBMISSION DATE)	X	*NO*				

ABSTRACT *(Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)*

On August 7, 2000, at 2126 hours, the Unit 3 reactor experienced an automatic shutdown (scram) due to an invalid low reactor water level signal sensed by the Reactor Protection System (RPS). The cause of the invalid reactor water level was the failure of the packing gland follower on RRV 3-2-654B which resulted in the depressurization of the variable leg to various instruments. A Primary Containment Isolation System (PCIS) Group 2 and Group 3 isolation signal, and secondary containment isolation also resulted. RPS, PCIS, and secondary containment isolation are Engineered Safety Features (ESF).

During the scram recovery, due to a false low reactor water level signal, the operating crew was directed by procedure to override the low reactor level and high drywell pressure initiation signals on Standby Gas Treatment (SGT) to allow for restoration. The override removed the automatic start function of both SGT subsystems. In addition, the Unit was in Mode 3 when the initiation signal was overridden and SGT was required to be operable per Technical Specifications. As a result, this placed the unit in Technical Specification LCO 3.0.3.

The LER is being submitted pursuant to the requirements of 10 CFR 50.73 (a)(2)(iv) due to the automatic actuation of Engineered Safety Features (ESF). Additionally, the reporting requirements of 10CFR50.73 (a)(2)(i)(B) and 10CFR50.73 (a)(2)(v) were met due to entry into Technical Specification LCO 3.0.3 and loss of safety function of Standby Gas Treatment (SGT) during the reactor scram recovery.

TEXT *(If more space is required, use additional copies of NRC form 336A)* **(17)**

Requirements of the Report

The LER is being submitted pursuant to the requirements of 10 CFR 50.73 (a)(2)(iv) due to the automatic actuation of the following Engineered Safety Features (ESF)(EIIS: JE): the Reactor Protection System (RPS), the Primary Containment Isolation System (PCIS), and the Secondary Containment Isolation System (which includes Standby Gas Treatment (SGT) initiation). Additionally, the reporting requirements of 10CFR50.73 (a)(2)(i)(B) and 10CFR50.73 (a)(2)(v) were met due to entry into Technical Specification LCO 3.0.3 and loss of safety function of SGT during the reactor scram recovery.

Unit Conditions at Time of Event

Unit 3 was in Mode 1 (RUN) at approximately 100 percent power (EIIS: EA) prior to the occurrence of the event. No other systems, structures, or components were inoperable which contributed to this event.

Description of the Event

On August 7, 2000, at 2126 hours, the Unit 3 reactor experienced an automatic shutdown (scram) due to an invalid low reactor water level signal sensed by the Reactor Protection System (RPS)(EIIS: JC). A Primary Containment Isolation System (PCIS) (EIIS: JH) Group 2 and Group 3 isolation signal, and secondary containment isolation also resulted. All control rods (EIIS: AA) fully inserted on the scram signal, bringing the reactor subcritical, and all emergency systems responded as expected following the scram for existing plant conditions.

The cause of the invalid low reactor water level signal was the failure of the packing gland follower on the variable leg root valve RRV 3-2-654B (see attachment 1). As a result, reactor pressure acting on the bottom of the packing created enough force to expel the failed packing gland and some of the packing from the packing chamber. This resulted in a leak through the packing gland. Excess flow check valve 3-2-17B, located upstream of RRV 3-2-654B, automatically closed as a result of sensing flow through the line. Closure of the excess flow check valve isolated the steam leak through the packing gland on RRV 3-2-654B.

As a result of the leak and the excess flow check valve closure, the variable leg to level transmitters LT-101C, LT-101D, LT-52B, and LT-83B depressurized. With the variable leg depressurized, the level transmitters experienced an increase in differential pressure, which translated into an indication of a decrease in reactor water level. Actual reactor water level had not changed.

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Level transmitter LT-101C provides input to the "A" RPS trip system and level transmitter LT-101D provides input to the "B" RPS trip system. Consequently, when both level transmitters experienced a high differential pressure, an invalid low reactor water level signal was sent to both RPS trip systems and a full reactor scram resulted. These transmitters sent additional signals to isolate the primary containment PCIS Group 2 and Group 3 isolation valves, and the secondary containment isolation valves. Level transmitters LT-52B and LT-83B sent invalid low reactor water level signals to the Digital Feedwater Control System (DFCS) (EIIS: JB) and the Automatic Depressurization System (ADS) respectively. ADS received a confirmatory low RPV level signal; however, the system did not actuate because required redundant signals did not exist. DFCS realigned to an operable transmitter.

The operating crew responded to the reactor scram and associated low reactor water level alarms in accordance with appropriate procedures. Actual reactor water level dropped to – 45" following the scram and was restored to the normal band with the Reactor Feed Pumps (RFPTs). The High Pressure Coolant Injection (HPCI) (EIIS: BJ) and Reactor Core Isolation Cooling (RCIC) (EIIS: BN) systems remained in standby because actual reactor water level remained above their initiation level.

Scram recovery actions were complicated by the presence of the invalid low reactor water level signal from level transmitters LT-101C and LT-101D. As a result, the reactor scram signal could not be reset to allow for resetting the RPS logic and the secondary containment isolation signal could not be reset to allow for securing the Standby Gas Treatment System (EIIS: BH) and restoring normal ventilation to the secondary containment.

With normal ventilation to the secondary containment shutdown, secondary containment temperatures began to increase. When the secondary containment high temperature alarm actuated, the operating crew entered the Secondary Containment Control Emergency Operating Procedure (EOP). The EOP directed the crew to enter a supplemental procedure, which directed overriding the low reactor water level and high drywell pressure initiation signals to Standby Gas Treatment and Secondary Containment isolation valves. Once the initiation signals were overridden, the procedure directed the crew to secure the Standby Gas Treatment fans and restore reactor building ventilation to its normal configuration. With reactor building ventilation restored, Secondary Containment temperatures returned to normal.

After approximately 24 hours, repairs were completed to RRV 3-2-654B, the variable leg was backfilled, and all affected level instruments were restored to an operable condition. Once this was complete, all affected systems were restored to their normal configuration and the operating crew exited the Secondary Containment EOP.

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TEXT *(If more space is required, use additional copies of NRC form 336A)* **(17)**

With Unit 3 in hot shutdown (Mode 3), Technical Specifications requires two Standby Gas Treatment subsystems to be operable. With the initiation signal for high drywell pressure and low reactor water level overridden, Unit 3 did not have two Standby Gas Treatment trains operable as required by Technical Specification for Mode 3. This placed the unit in LCO 3.0.3. Entry into LCO 3.0.3 constitutes placing the unit in a condition prohibited by Technical Specifications and is reportable in accordance with 10CFR50.73 (a)(2)(i)(B).

With the Standby Gas Treatment system initiation signal overridden, it would not have automatically initiated to perform its design safety function during a design basis LOCA event. A loss of safety function of the system is reportable in accordance with 10CFR50.73 (a)(2)(v). The Standby Gas Treatment System initiation signal was overridden for approximately 24 hours.

Cause of the Event

The cause of the event was the failure of the packing gland follower on RRV 3-2-654B which resulted in depressurization of the variable leg to various instruments. This resulted in a reactor scram due to an invalid low RPV water level signal.

The cause of the packing gland follower failure has been determined to be Intergranular Stress Corrosion Cracking (IGSCC).

Analysis of the Event

Subsequent to the reactor scram, all emergency systems operated as expected for plant conditions. Reactor water level remained at least 127 inches above the top of active fuel for the entire event and the fuel cladding integrity was never challenged. All mitigating systems required for injecting water into the Reactor Pressure Vessel (RPV) during a design basis accident were available during the event. With the Standby Gas Treatment (SGT) system initiation signals on reactor low level and high drywell pressure overridden per plant procedures, the system would not automatically start in the event of a design basis event; however, the SGT system remained available for manual operation and specific procedural guidance existed for placing it in service, if plant conditions warranted it. Additionally, the high radiation initiation signal was not overridden as part of this procedure; therefore, if a subsequent high radiation condition occurred, the secondary containment would have isolated and SGT would have initiated to mitigate the release of radioactivity to the environment.

A failure of a packing gland on an instrument line is bounded by an analysis described in Section 5.2 of the UFSAR. An instrument line downstream of the excess flow check valve (which was the case in this event) would be isolated by the excess flow check valve. A $^1/_4$ inch restricting orifice in the instrument line will limit flow from an unisolable instrument line break upstream of the excess flow check valve to 15.8 gpm. This size leak would be within the capacity of normal reactor coolant makeup, within the capacity of SGT, and well below the offsite radioactivity release limits in 10CFR100.

A PSA analysis concluded that there was no change in core damage frequency as a result of overriding the Secondary Containment Isolation signal and the SGT initiation signal as directed by plant procedures.

Corrective Actions

The following corrective actions have been performed or are in progress:

- Instrument line root valve RRV 3-2-654B packing gland follower has been replaced.
- An initial walkdown of accessible root valves and rack root valves in the Reactor Building was completed on both units. No obvious cracks were identified.
- A detailed plan is being developed to evaluate generic implications associated with this condition.

Previous Events

No previous events could be identified where a failure of the packing gland assembly caused an instrument line to depressurize and the reactor to scram

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ATTACHMENT 1

SIMPLIFIED DRAWING OF AFFECTED LEVEL TRANSMITTERS